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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,972	12/29/2005	Yasuhiro Miyamoto	Q92215	3619
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EXAMINER				
MULLINS, BURTON S				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/562,972

Applicant(s)

MIYAMOTO ET AL.

Examiner

BURTON MULLINS

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 01 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-8508)
4) ☐ Interview Summary (PTO-413)
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____
Paper No(s)/Mail Date _____

DETAILED ACTION

Drawings

1. Replacement Figures 3a and 3b have been received & are approved.

Specification

2. Amendments to the specification have been received & are approved.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-116105 (JP '105). JP '105 teaches a moving magnet type linear actuator comprising: a stator having a stator base and an armature (Fig.2) including a magnetic iron core 3 fixed on the stator base 11 and an armature winding 12 wound around the magnetic iron core; and a movable body 13 (Fig.12) having a field permanent magnet 14/15 arranged oppositely to the magnetic iron core 3 through a magnetic gap 9 (Figs.1&2) and a magnetic holder 41/42/43 (Fig.12) supporting the field permanent magnet 14/15 and movably arranged on the stator base, wherein the magnetic holder is made of a non-magnetic substance (inherent), a magnetic back yoke 1 (left & right parts, Fig.2) is arranged on the side opposite to the armature with respect to the field permanent magnet (Figs.1&2), a width thereof being approximately equal to a width of the field permanent

magnet (Fig.1), a length thereof being not smaller than the stroke of the movable body (Fig.2), and both ends thereof in the longitudinal direction being fixed to the stator (i.e., one end of each left and right yoke 1 is fixed to stator; Fig.2), and a gap 9 is formed between the magnetic yoke 1 and the field permanent magnet 14/15 (Figs.1&2).

Regarding claim 7, as seen in Fig.1, the yoke 1 comprises laminated plates.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Korenaga et al. (US 6,037,680). Korenaga teaches a moving magnet type linear actuator comprising: a stator (fixed unit; Fig.1) having a stator base (not shown, inherent since stator is 'fixed') and an armature 10 including a magnetic iron core (center yoke) 6 fixed on the stator base and an armature winding 8/9 wound around the magnetic iron core 6; and a movable body (stage) 2 having a field permanent magnet 5 arranged oppositely to the magnetic iron core 6 through a magnetic gap (Figs.1-3&4C) and a magnetic holder (holding plates) 4 supporting the field permanent magnet 5 and movably arranged on the stator base, wherein the magnetic holder is made of a non-magnetic substance (inherent), a magnetic back yoke (side yoke) 7 is arranged on the side opposite to the armature with respect to the field permanent magnet (Figs.1-3&4C), a width thereof being approximately equal to a width of the field permanent magnet (Figs.1-3&4C), a length thereof being not smaller than the stroke of the movable body (Figs.1-3), and both ends thereof in the longitudinal direction being fixed to the stator (Figs.1-3), and a gap is formed between the magnetic yoke 7 and the field permanent magnet 5 (Figs.1-3&4C).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga in view of applicant's admitted prior art (see discussion on pp.1-2 and Figs.3A-3B of specification). Korenaga teaches applicant's invention but does not teach a scale fixed to the magnetic holder, and a detecting segment fixed to the stator base (claim 2); or two linear guides arranged in parallel so as to sandwich both sides of the armature, guide blocks are arranged on each of the linear guides, and the magnetic holder fixed on the guide blocks (claim 3).

Applicant's admitted prior art teaches a scale segment of a linear scale 53 fixed to the side of a magnetic holder (yoke) 23 of the movable body 20, and a detecting segment 52 of the linear scale is fixed to the stator base 31 with a gap from the scale segment 53 (specification p.3; Figs.3A-3B). Further, two linear guides 41 are arranged in parallel so as to sandwich both sides of the armature 32 (Fig.3B), guide blocks 42 are arranged on each of the linear guides 41, and the magnetic holder (yoke) 23 is fixed on the guide blocks for forcibly stopping the running of the actuator at either end thereof (specification p.3; Figs.3A-3B).

It would have been obvious to modify Korenaga and provide a scale and detector per applicant's admitted prior art to detect the position of the movable body, and to provide linear guides and guide blocks per JP '328 to forcibly stop the running of the actuator at either end thereof.

Regarding claim 4, Korenaga Fig.3 shows that the non-magnetic holder 4a includes a square cut out or slot for the magnet 5. The width of the slot would correspond to the space between the guide blocks of JP '328 since these would be arranged between the yokes 7, which surround the armature, the latter having generally the same width as the magnet 5 (Korenaga, Fig.3).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga and JP 2000-308328, in view of Tsuboi et al. US 2001/0048249. Neither Korenaga nor JP '328 teach stoppers on the linear guides.

Tsuboi teaches stoppers 18, 20 (Figs.1-2) at each end 17, 19 of linear guides, thereby acting as buffers for protecting slider 6 from collision [0051].

It would have been obvious to modify Korenaga and JP '328 and provide stoppers per Tsuboi to protect the slider from collision.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korenaga in view of Hwang et al. (US 6,528,907). Korenaga teaches applicant's invention but does not teach guide pipes in the stator for cooling refrigerant.

Hwang teaches a linear motor with a stator 54 and stator coils 53, the stator having guide pipes (cooling channels) 7 for forcible cooling refrigerant (e.g., air) embedded in the stator base (back plate) 50 (Fig.8; c.4:50-63). The cooling channels provide effective cooling of the stator (c.1:60-64).

It would have been obvious to modify and provide a stator with guide pipes per Hwang to cool the stator.

Response to Arguments

10. Applicant's arguments filed 01 February 2008 have been fully considered but they are not persuasive.

11. Regarding JP '105, applicant argues that the magnetic holder is not inherently non-magnetic. However, it is clear from Figs.1&12 that the magnetic holder comprising parts 41/42/43 must be non-magnetic because if it was not, then flux from the magnets would flow through the holder and the linear motor would not operate properly. The multiple magnets 14 & 15 would in essence comprise a single magnet rather than separate magnets providing distinct poles. Operation can be seen from Figs.2-4&15-16, which show magnetic flux lines passing through the magnets 14 & 15, not the magnetic holder 16/41. If the magnetic holder comprised magnetic material, flux would circulate through the holder, thus increasing iron loss and reducing thrust, contrary to the explicit intention in JP '105 (see abstract). See also paragraphs 49-50 of the machine translation describing the loop the flux travels.

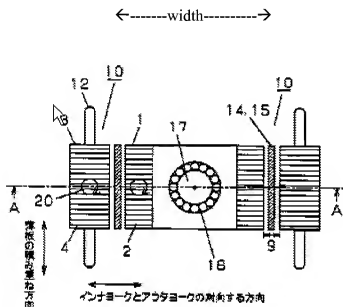
Further evidence that the holder is non-magnetic comes from paragraphs 103-107 which describe the "flexible" region 13 formed by the "frame" 40, "interval" 41, "supporter" 42 and "spacer" 44. The flexible region is light in weight (par.109). Flexibility and light weight are not characteristic of magnetic materials.

Thus, extrinsic evidence makes it clear that the magnetic holder is made of a non-magnetic substance.

Regarding applicant's argument that the width of the magnetic back yoke 1 in JP '105 is not approximately equal to a width of the field permanent magnet 14/15, it is evident from cursory inspection of Fig.1 that the magnetic back yoke 1 is "approximately equal" to a width of

Art Unit: 2834

the field permanent magnet 14/15. "Width" is taken to refer to the transverse length spanned by the yoke 1 and movable section 13 comprising the permanent magnet 14/15, as seen axially from above in Fig.1 and annotated below.



12. Regarding Korenaga, applicant argues that the magnetic holder 4 is not inherently made of non-magnetic material. Again, it is noted that Korenaga's machine would not function properly if the magnetic holder 4 comprised magnetic material since flux from the magnets 5 would divert through the holder and reduce the magnetic flux in the yokes 6 and 7, thus reducing the flux interacting with the coils, which is what makes the stage move. This is contrary to the operation of the motor taught at c.10:7-17. Flux from a magnet 5 enters the center yoke 6, branches forward and backward in the longitudinal direction to reach the two end portions of the yoke, branches up and down to enter the side yokes 7, and flows from the front and rear end

portions to oppose magnet 5 and reach the S pole of the opposing magnet 5. This magnetic circuit would not operate properly if the holder were magnetic since flux flow would divert down the side of the holder to complete another circuit between the magnets, rendering the machine inefficient at best, inoperable at worst. One of ordinary skill would realize that the holder is inherently non-magnetic.

13. Regarding clarification of the 103 rejection over Korenaga and JP '328, applicant points out that the citation on pp.2-3 and Figs.3a-3b in the specification refers not to JP '328 but instead to non-specified "prior art". The syntax and structure of the specification led the examiner to consider pp.1-3 and Figs.3a-3b as referring to JP '328. The rejection has been modified to refer to the secondary reference instead as "applicant's admitted prior art". The substance of the rejection, however, remains the same as all the elements were clearly taught on pp.2-3 and shown in Figs.3a-3b.

14. Applicant's argument regarding this prior art is not persuasive since the prior art teaches linear scale 53 is on yoke 23 (pp.2-3 and Fig.3b). The yoke 23 comprises a "magnetic holder" in the sense that yoke "holds" or supports magnets 21. Further, the yoke 23 is movable since it is part of "movable body" 20. The issue of whether or not the prior art magnetic holder is non-magnetic is not germane since this feature is disclosed by Korenaga. Arguments against the references individually are not persuasive since one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BURTON MULLINS whose telephone number is (571)272-2029. The examiner can normally be reached on 9-5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BURTON MULLINS/
Primary Examiner, Art Unit 2834

bsm
23 April 2008